

CENAPAD - PE

Centro Nacional de Processamento de Alto
Desempenho de Pernambuco



High Performance Computing

Fornecimento de Equipamentos de Computação de Alto Desempenho

Anexo I – Referências Técnicas e Comerciais





UFPE
Universidade Federal
de Pernambuco

Bull Ltda



Ref : Anexo I – Referências Técnicas e Comerciais






Carta Convite 001-07 - Proposta: DBF 170/07

Projeto: Servidores HPC para CENAPAD-PE



Referências Técnicas e Comerciais de Projetos HPC (High Performance Computing) implementados pela Bull

 <p>UFPE Universidade Federal de Pernambuco</p>	<p align="center">Bull Ltda</p> <p>Ref : Anexo I – Referências Técnicas e Comerciais Carta Convite 001-07 - Proposta: DBF 170/07 Projeto: Servidores HPC para CENAPAD-PE</p>	
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 <p>CEA Grenoble France 2002-Q4</p>	<p>NovaScale 4040 cluster used in many scientific area (plasma physics, chemistry, biology, seismology, climatology, astronomy, ...)</p> <p>Bull services Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)</p> <p>Customer contact : Jacques David (jacques.david@cea.fr)</p>
 <p>CEA-DAM Ile-de-France France 2003-Q1</p>	<p>CEA/DAM Île-de-France owns 2 NovaScale 5160, used for general purpose numerical simulations.</p> <p>Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)</p> <p>Customer contact : Pierre Leca (pierre.leca@cea.fr)</p>
 <p>Université de Versailles Saint-Quentin France 2003-Q2</p>	<p>NovaScale 4040 used by the computer science department for fundamental researches in algorithmic and code optimisation.</p> <p>Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)</p> <p>Customer contact : William Jalby (jalby@prism.uvsq.fr)</p>
 <p>Université de Lille, LIFL France 2003-Q3</p>	<p>Laboratoire d'Informatique Fondamentale de Lille is a research entity associated with the CNRS where 60 researchers and professors, 11 engineers, technicians and staff work. LIFL has access to a rich computing infrastructure (parallel machines, graphic equipments, and more than 200 workstations under Ethernet and ATM). LIFL develops, amongst other things, solutions that allow the use of standard hardware architectures for real time application. The laboratory needed for this type of use an SMP server running a Linux-based real-time operating system. They chose a NovaScale 4040 server based on Intel® Itanium® processors.</p> <p>Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)</p> <p>Customer contact : Jean-Luc Dekeyser (dekeyser@lifl.fr) ERIC.DECOEYERE@BULL.NET</p>
 <p>Université de Rennes France 2003-Q3</p>	<p>NovaScale 4040 used by the computer science department</p> <p>Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)</p> <p>Contact : florence.marguerie@bull.net</p>



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**Institut de Mécanique
Céleste et de Calcul des
Éphémérides
France
2003-Q3**

NovaScale 4040, (4 Itanium2 1,5GHz/6M) for astronomy applications

Bull services: Bull delivered a turn-key solution, including support and user training (system administration)

Contact : Mickael Gastineau (gastineau@imcce.fr)



**University of Stuttgart
Germany
2003-Q3**

The University of Stuttgart selected a Bull NovaScale® server (NovaScale 5160, 16 CPU, 32 GB memory) for its 64-bit SMP architecture, based on Intel®Itanium®2 processors and its capacity to run both Linux ®and Windows®. NovaScale's multi-environment capability will enable the University and its industrial partners to test the same HPC applications under both environments simultaneously and measure their respective performance. They will primarily be testing fluid mechanics (aerodynamic, acoustics) and structural analysis applications.

Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)

Contact : Michael Resch (resch@hlrs.de)



**Thalès
France
2004-Q3**

A NovaScale 4040 (4 processors) used for imaging analysis and for signal analysis. Excellent performance of Itanium® 2 for Fourier transformations, spectrum analysis and convolution (image fluidity).

Bull services: Bull delivered a turn-key solution, including support

Customer contact : Dominique Ragot
(dominique.ragot@fr.thalesgroup.com)



**ENSIMAG
France
2004-Q3**

ENSIMAG is the leading computer science engineering school in France. Its NovaScale 5160 is for general purpose student projects.

Bull services: Bull delivered a turn-key solution, including support and user training.



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Universidad Castilan de La Mancha
Spain
2004-Q3

1x NovaScale 6320 / 32x Itanium® 2 1.5GHz-4M / 64GB RAM
1x NovaScale 4040

The University of Castilla-La Mancha has chosen to use a Bull NovaScale® 6320 server at its Institute of Environmental Sciences in Toledo. The server will be used to execute multiple versions of the Institute's numerical model for atmosphere processes, known as MOMAC.

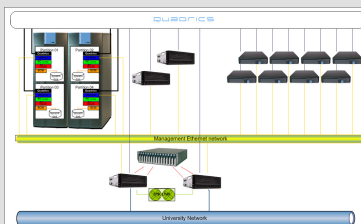
The server will apply the MOMAC model to simulate climate evolution scenarios at both a continental level and national level for daily weather forecasts. The server will also be used to model and quantify the circulation of atmospheric polluting agents. Finally, it will provide computing capability in the fields of genomic research, molecular and protein analysis, as well as for supporting any massive calculation requiring parallel processing.

Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)

Contact : <http://www.uclm.es/>



Universidad de La Laguna de Tenerife
Spain
2004-Q4



A complete and flexible supercomputer including 64x Itanium® 2 processors (384GFlops) and 256GB RAM interconnected with a high-end Quadrics interconnect.

- 1x NovaScale 6320 / 32x Itanium2 1.5GHz-4M / 128GB RAM (4 partitions)
- 4x NovaScale 4040 / 4x Itanium® 2 1.5GHz-4M / 16GB RAM
- 8x NovaScale 4020 / 2x Itanium® 2 1.5GHz-4M / 8GB RAM
- 1x FD2300 5TB Storage
- Quadrics Interconnect
- Bull Advanced Server (BAS)

Bull services: Bull delivered a complete solution including facility design and building, air cooling design and datacenter integration. Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring).

Contact: <http://www.ull.es/>
jose-maria.bigas@bull.net (bull contact)



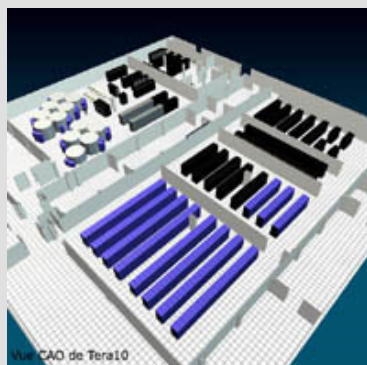
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CEA DAM: TERA10
France
2004-Q4



The DAM department (Military Application Department) of the CEA - the French Nuclear Power Agency - has selected Bull to provide a supercomputer delivering a power of **over 52 teraflops** (fifty two thousand billions operations per second).

This supercomputer named **Tera10** increases CEA Military Applications Department's supercomputing power by the factor of ten. It is used for its Simulation Program that guarantees the continuation of the French nuclear deterrent, following the cessation of nuclear testing.

Designed by Bull, Tera10 integrates **567 NovaScale 6160 computing nodes**, each including eight dual-core **Itanium® processors** (Montecito). Quadrics, the leader in supercomputing network, provided a QsNetII high performance network to interconnect the NovaScale servers. The global configuration **features over 9,000 processors with 30 terabytes of core memory**.

Beyond power, Tera10 also requires a huge storage capacity for data produced by the Simulation Program. Therefore, its configuration also includes **54 NovaScale I/O servers managing one petabytes** (one million of billions bytes) of disk space with a **sustained throughput of 100 GB/s**. It also includes two additional NovaScale servers for system management

Tera10 operates the **Bull HPC software platform** that includes the Linux® operating system and **Lustre, the global and parallel file system**. This platform is based on open source software integrated and optimised by Bull's HPC competence centre in Echirolles, France.

Tera10 was deployed end of 2005. By 2010, the CEA physicists will need a power of hundreds of teraflops. Bull and its partners are already working together in this perspective.

"For our Simulation Program, we have selected Bull's supercomputer for the global performance it provides. Bull's architecture based on standard components and open software delivers both the scalability and power we require for our future development" Jean Gonnord, Program Director for Numerical Simulation & Computer Sciences at CEA/DAM

Customer contact : Alexandra Bender – Tel : 33 (0)1 40 56 17 16 – a.bender@cea.fr



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**Université Versailles Saint
Quentin**
France
2004

Graphics cluster

9 Bull TM600 visualisation nodes and 1 management node

Software

- Mandrake 9 (kernel 2.4)
- CHROMIUM. 1.0 cluster graphics software

Hardware

- TM600 in IA32, 2,8 GHz Pentium4 Intel processor. IDE disks
- 10/100 Ethernet management interconnect network.
- Chromium Gigabit Ethernet interconnect network
- AGP 4X graphics coupling with NVIDIA Quadro 900XGL (128 Mb SDRAM)

Contact : William Jalby (jalby@prism.uvsq.fr)



**CEA DAM -
France**
2004-Q4

Graphics cluster

8 Grand Prairie 7525GP2 visualisation servers and a management node, with 2 Bull Express 5800 Re-1 servers, linked to a Bull FDA1300 storage bay with 11 Fibre Channel (FC) disks. All servers are equipped with Intel Xeon 64-bit Extended processors.

Software

- All servers operate under Linux RedHat RHEL3 (Kernel 2.4)
- LUSTRE (2005) file system

Interconnection network

- management by native gigabit Ethernet + central support of IPMI (for BMC)
- Infiniband 4x compute interconnect network and Mellanox OpenIB switch and software.

Contact : P.GREGOIRE (philippe.gregoire@cea.fr)



**CEA DAM
France**
2005-Q4

TERA10 Storage

Bull provided a storage cluster including 4 PetaBytes of disks, as well as the server cluster used to manage them – and to which the disks are physically connected. The cluster relies on the HPSS software and the LUSTRE distributed file system.

Bull services: Integration of the storage system and the server cluster, installation, implementation, and system maintenance.

Customer contact : Jacques-Charles Lafoucrière
(jc.lafoucriere@cea.fr)



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ONERA
France
2005-Q4

Replacement and extension of the centralised compute servers with new systems that allow a significant increase of the computing power.

The project is divided into three successive phases: 1st quarter 2006, 4th quarter 2006, 4th quarter 2007.

The first phase system includes 14 NovaScale 5160 compute nodes with 16 Itanium® 2 cores each, 6 NovaScale service nodes and a Quadrics QsNetII network.

Bull services: Bull installed the system, and provides support and maintenance.



MBDA
France
2005-Q4

Replacement of the HP SC45 cluster (16 ES45 nodes with four Alpha EV68 processors each, 1,25GHz, and 8 GB memory).

The replacement will take place in two steps : first step end 2005, must provide additional computing power equals at least to 1.5 that of the the previous HP SC45 cluster ; second step end 2006, with installation directly on the new site, must provide additional computing power equalsat least to 4 times that of the HP SC45 cluster.

The step 1 system has 10 NovaScale 5160 compute nodes with 8 Itanium® 2 nodes each, providing a 512 Gflops peak performance, 2 NovaScale 4040 service nodes and a Quadrics QsNetII computing network.

Bull services: Bull installed the system, and provides system maintenance.



**Université Versailles Saint
Quentin**
France
2005-Q4

Graphics cluster

PC cluster for high definition scientific visualisation. This cluster had to include two sub-systems: a graphics sub-system and a compute sub-system.

The proposed system is composed of 9 identical graphics and compute nodes, a centralised management note, and an Ethernet 1 Gigabit switch for the fast interconnect network.

Bull services: Bull installed the system, and provides system maintenance.

Contact: Florence.Marguerie@bull.net



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EDF R&D
France
2005-Q4



EDF R&D decided in 2005 to renew their computer dedicated to the development of code_Aster. Code_Aster is an Open software whose development is coordinated by EDF R&D. This computer simulation tool is used by EDF to analyze the actual behavior and risks of functioning mechanical and civil engineering structures, with the ultimate aim of guaranteeing technical and economical control of its electricity production infrastructures, from design to end of life.

EDF has chosen the Bull offer, composed of 7 NovaScale 5160 compute nodes with 16 Itanium® 2 cores each, supplying a 715 Gflops peak performance, 6 NovaScale 4040 service nodes and a Quadrics QsNetII network.

Bull services: Bull installed the system, and provides system maintenance.



Pininfarina
Italy
2005-Q4

Pininfarina has chosen NovaScale 4020 servers for its high-performance computing (HPC) centre dedicated to product simulation and finished components analysis.

The computer simulation of the whole project/process cycle enables Pininfarina to assess the feasibility and quality of every single component in advance, before physically producing the prototype. Using simulations means fewer prototypes have to be produced for experimental purposes and improves the company's competitive position both in terms of production timing and costs.

The system includes 8 NovaScale 4020 servers, with 2 Intel® Itanium® 2 1.6Ghz/3MB processors each, and 3 shared SJ-0812 storage bays.

Pininfarina is running successfully on its NovaScale 4020 servers a wide range of applications: Nastran, from MSC Software, ABAQUS, from ABAQUS Inc, PAM-CRASH from ESI Group, RADIOSS from Mecalog, Fluent from the Fluent company and STAR-CD from CD-Adapco.

Bull services: Bull installed the system, and provides system maintenance.



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**National Oceanography
Centre, Southampton**
UNIVERSITY OF SOUTHAMPTON AND
NATURAL ENVIRONMENT RESEARCH COUNCIL

**National Oceanography
Centre, Southampton
United Kingdom**
2006-Q1

With 450 scientists and 600 students, the National Oceanography Centre of Southampton is one of the world's leading centres for research and education in marine and earth sciences. Bull has implemented its High Performance Computing solution, based on NovaScale servers, to improve the capacity of NOC's analytical infrastructure. N.O.C. can now act as a central resource to run oceanographical, climate modelling and geophysical applications.

2003 Q4 :

- A NovaScale 5160 – 16 processors.
- Six NovaScale 4040 – 4 processors.
- A NovaScale 4040 – 2 processors.

2005 Q2 :

- Upgrade of NovaScale 5160 to NovaScale 6320 – 32 processors
- Upgrade of Quadrics network

In February 2006, NOC boosted processing power by 60% by integrating a second NovaScale 6320 and two more NovaScale 4040.

Bull services: Bull installed the system, and provides training and system maintenance

Contact: http://www.soc.soton.ac.uk/soc_home2.php?pagetype=ITG
Vic Cornell (vcc@soc.soton.ac.uk)
Jeff.Spencer@bull.co.uk



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Dassault Aviation
France
2006-Q1

Dassault aviation needed more computing power for the development of their Falcon airplane (acoustic simulation, aerodynamics, structure analysis). They wanted to diversify their computing platforms, and introduce Intel/Linux environments with OpenMP, to be able to open up to the standards used in research and benefit from synergies. To compensate the heterogeneity of their platforms and optimise task scheduling on the various computers, Dassault turned to grid computing technologies (SGE solution)..

1 Tflop – 9 SMP servers with Quadrics and Lustre

2004-Q3 :

Cluster of three NovaScale 6320 servers, for production (scientific computing), three NovaScale 4020, 4040 and 5160 servers for development and compilation, HPC Linux.

2005-Q4 :

Integration in existing configuration of a Lustre file system: two NovaScale 4020, one FDA 1400 and Lustre license.

2006-Q1 :

Integration in existing configuration of four NovaScale 6320 servers (16 processors each), doubling of storage capacity, update of Quadrics interconnect and integration in Lustre configuration.

Bull services: Bull delivered a turn-key solution, including support and user training (system administration, application porting, optimization, monitoring)

Contact : Alain Samblat (alain.samblat@dassault-aviation.fr)
Olivier.bunouf@bull.net



University of Manchester
United Kingdom
2006-Q1

Cluster of 26 Intel® Itanium® 2-based NovaScale 3045, interconnected by a high performance Quadrics monorail network.

This supercomputer was the first in the UK to use Intel's Dual-Core Itanium® 2 processor (Montecito) and the first implementation in the world of Bull's new NovaScale® 3005 Symmetrical Multi-Processor server technology. With a total of 208 cores the Bull NovaScale supercomputer has a peak performance of 1.33 Teraflops.

This cluster is the main supercomputer of the University, it is available to all staff and research students at the University. It therefore supports a very wide range of applications, with a predominance of chemistry applications. It has boosted processing power by 35x the previous generation, enabling more advanced research to be undertaken in areas such as Computational Chemistry, Engineering, Biomechanics and Climate modelling.

Bull services: Bull delivered a turn-key solution, including support



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Loughborough University
United Kingdom
2006-Q3

Loughborough University's Department of Mathematical Sciences is active in research across a broad spectrum of mathematics and its applications and the staff includes three international research prize winners.

They chose Bull to supply their new HPC cluster made up of 18 NovaScale 3005 series computers, equipped with Intel® Itanium® 2 dual core processors (Montecito).

In a full competitive tender situation, Bull was seen to offer a more complete and professional solution with better support.

Bull services: Bull delivered a turn-key solution, including support.



EADS Nuclétudes
France
2006-Q3

Nuclétudes is a company belonging to the EADS group, which designs, develops and manufactures solid state broadband and ultra wide band amplifiers and systems, especially for space and armament.

Bull delivered a 4 nodes cluster (including an administration node), based on Bull NovaScale 3005 servers, equipped with two Intel® Itanium® dual core processors (Montecito) each, with a Quadrics compute interconnect and Gigabit Ethernet management interconnect.

This cluster is dedicated especially to study the durability and vulnerability of electrical and electronic components used on board missiles.

Bull services: Bull delivered a turn-key solution, including support.



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Ensam
France
2006-Q3

ENSAM (Ecole Nationale Supérieure d'Arts et Métiers) is the largest engineering school in France, with 1000 graduates each year in mechanical and industrial engineering. ENSAM needed a computing solution for three of its laboratories: numerical simulation in fluid mechanics; energetics and internal fluid mechanics; structural mechanics (modeling for products design and manufacturing processes).

The objectives of ENSAM were the following:

- Provide users with enough computing power to support their needs in terms of job number, job size and variety of applications, using a solution that can last for the four coming years.
- Provide users with a system that will allow them to evolve their codes towards more parallelism (mainly MPI).
- Prepare the future by allowing for a potential evolution towards a unique computing centre shared with the other ENSAM laboratories.

Bull proposed a cluster with 5 NovaScale 8-way compute nodes based on Intel® Itanium® 2 1,6 GHz dual core processors (Montecito), whose main advantage is to offer 2 x 9 MB L3 cache. The interconnect is based on InfiniBand. A FDA1500 storage bay with a capacity of 3TB is linked to the management node with Fibre Channel.

This solution has a peak performance of 256 GFlops and is a perfect match for the level of parallelism of the user applications. It can easily grow by adding compute nodes or memory in some nodes.

Bull services: Bull delivered a turn-key solution, including support.



AVL
Austria
2006-Q3

AVL is the world's largest privately owned and independent company for the development of powertrain systems with internal combustion engines as well as instrumentation and test systems. This Austrian-based company employs 3440 people world-wide. AVL focuses on the market and needs of the automotive industry, with a wide range of simulation tools with co-simulation capability – from IC engine combustion to entire vehicle thermal management systems and from piston and piston ring dynamics to vehicle optimization of fuel consumption and emissions.

AVL has been buying HPC clusters from Bull since 2005, for its own computing requirements. In 2006, AVL bought two clusters of NovaScale servers equipped with Intel® Xeon processors.

- The Advanced Simulation Technologies department uses an 8-node cluster with Gigabit Ethernet interconnect to develop their AVL Fire software.
- The MOT department has a 16 nodes cluster with Infiniband interconnect which will be the reference for future AVL Fire clusters for customers all over the world.

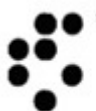
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"Jožef Stefan"
Institute

Institut Jožef Stefan
Slovenia
2006-Q4

The Jožef Stefan Institute is the biggest public research institute in Slovenia. About 800 people are employed by the Institute; including 400 Ph.D. scientists. The main research areas are physics, chemistry, molecular biology and biotechnology, information technologies, reactor physics and technology, energy and environment.

The Reactor Engineering Division needed new computing power for its activities, focused mainly on fundamental and applied nuclear engineering and nuclear safety research.

Bull proposed a cluster of 13 NovaScale servers based on Intel® Xeon® processors, with a Gigabit Ethernet interconnect and FDA storage.

Bull services: Bull delivered a turn-key solution, including support.



AleniaAeronautica

Alenia Aeronautica
Italie
2006-Q4

Alenia Aeronautica, a Finmeccanica company, and the leading Italian aeronautical company, has chosen Bull and Quadrics to provide a supercomputer for their engineering department, to help undertake more advanced simulations with Nastran, Fluent and many more structure analysis and CFD applications.

The main issue for Alenia Aeronautica was to reconcile the differing requirements of its applications: some codes need the power of Itanium-based servers, while others would rather use X86 systems. They naturally turned for assistance to Quadrics, another Finmeccanica company whose networking products are behind some of the world's fastest computers, and to Quadrics' partner Bull for global infrastructure expertise. Bull proposed a hybrid solution that provides an optimal fit with all application requirements.

With a **peak performance above 4 Teraflops, the Alenia supercomputer is one of the largest in Italy.** Half of the computing power is delivered by Bull's Itanium®-based NovaScale 3005 and 5005 servers. The other half will be based on X86-64-bit commodity servers. The global infrastructure and architecture of this hybrid supercomputer was designed and implemented by Bull, especially the unique global file system common to all servers. All servers communicate through a high-performance Quadrics QsNet II interconnection network. Bull also provides its complete and integrated HPC software environment including software development tools and cluster management tools, as well as the storage infrastructure based on the enhanced Bull version of the Lustre file system.

Bull services: Bull designed the global architecture of this complex infrastructure integrating different types of hardware based on different technologies. Bull installed the whole system and supports it.



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CCRT
France
2006-Q4

The CCRT (Center for Research and Technology Computing) is a high-performance computing centre working particularly at digital simulation of reactors and combustion cycle installations, major research programs (most notably in climatic research and biological sciences), and the development of new technologies. Part of Computing Complex sited at the heart of the TER@TEC competitiveness cluster dedicated to digital simulation and high-performance computing, the CCRT is open to industrial partners and collaborations with the scientific community.

The CCRT has awarded Bull the contract to build **a supercomputer delivering in excess of 43 teraflops**. The new supercomputer, designed by Bull, is made up of a cluster of NovaScale servers, including 848 processing nodes, and 26 dedicated I/O and administration nodes. Each node features four Intel® Itanium® 2 dual-core processors. The system is operated via the HPC platform specially optimized by Bull and featuring, notably: the Linux® operating system; the system administration software suite developed by Bull for large clusters; the Intel development environment; and the Lustre® file system from CFS. The NovaScale servers will be connected by a high-performance InfiniBand network, supplied by Voltaire. The data storage infrastructure, also designed and integrated by Bull, will offer in excess of 420TB of disk storage capacity.

The CCRT's supercomputer will be made available for the scientific and industrial communities to use in major areas of research, particularly aeronautical engineering, energy, life sciences and environmental research. In particular, the system will be used by the members of the CCRT, including the French Atomic Energy Authority (the CEA), Electricité de France (EDF) and three companies from the SAFRAN Group: SNECMA, Turbomeca and Techspace Aero. It will be integrated into the CEA's computing complex to create one of the world's most significant scientific computing infrastructures enabling the research community to benefit from synergies between programs in defence, industry and research.

Bull services: Bull delivered a turn-key solution, including support.



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Université de Reims
Champagne Ardenne
France
2005-Q4

The University of Reims, in partnership with the regional government and several regional university centres, has acquired a new generation scientific computer, with a view to develop scientific research and collaboration with local companies on a regional scale.

Known as « ROMEO II », the system proposed by Bull includes 2 NovaScale 5005 SMP compute nodes, 6 NovaScale 3005 compute nodes, 3 NovaScale 3005 service nodes, i.e. a total of 54 Intel® Itanium® 2 processors providing 500 Gigafllops of computing power. The servers are interconnected by a QsNetII network from Quadrics. Bull also provided a 3 TB storage bay and a library.

Installed since end 2006 at the University of Reims Computing Centre, ROMEO II is available to all research staff, whatever their location, through the TELEMUS II very high bandwidth regional network, and through the RENATER 4 national network. Its computing power will also be made available to companies through partnership agreements.

The computer will be used in particular for research on:

- **mathematics and computer science:** parallelisation of non numerical algorithms (optimisation of planning and task scheduling, logic device design, cryptography), performances and programming models for new computer architectures,
- **physics and engineering:** fluid mechanics, materials modelling for wrapping and conditioning, complex molecular systems modelling,
- **implementation and operation of clusters of multiprocessor servers,** such as those composing ROMEO II.

Bull services: Bull installed the system, and provides system maintenance.



RRZN (Regionales Rechen
Zentrum für Niedersachsen)
Germany
2006-Q4

RRZN, the Regional Compute Centre for Lower Saxony, is one of the six major HPC compute centres in Germany and is hosted by the University of Hanover.

RRZN wanted a Xeon-based cluster with a Gigabit Ethernet interconnect, and they had very tight budget constraints.

Bull proposed an optimized cluster of 60 Intel Xeon NovaScale nodes, offering very good benchmark results - which made the difference.

Bull services: Bull installed the system, and provides system maintenance.